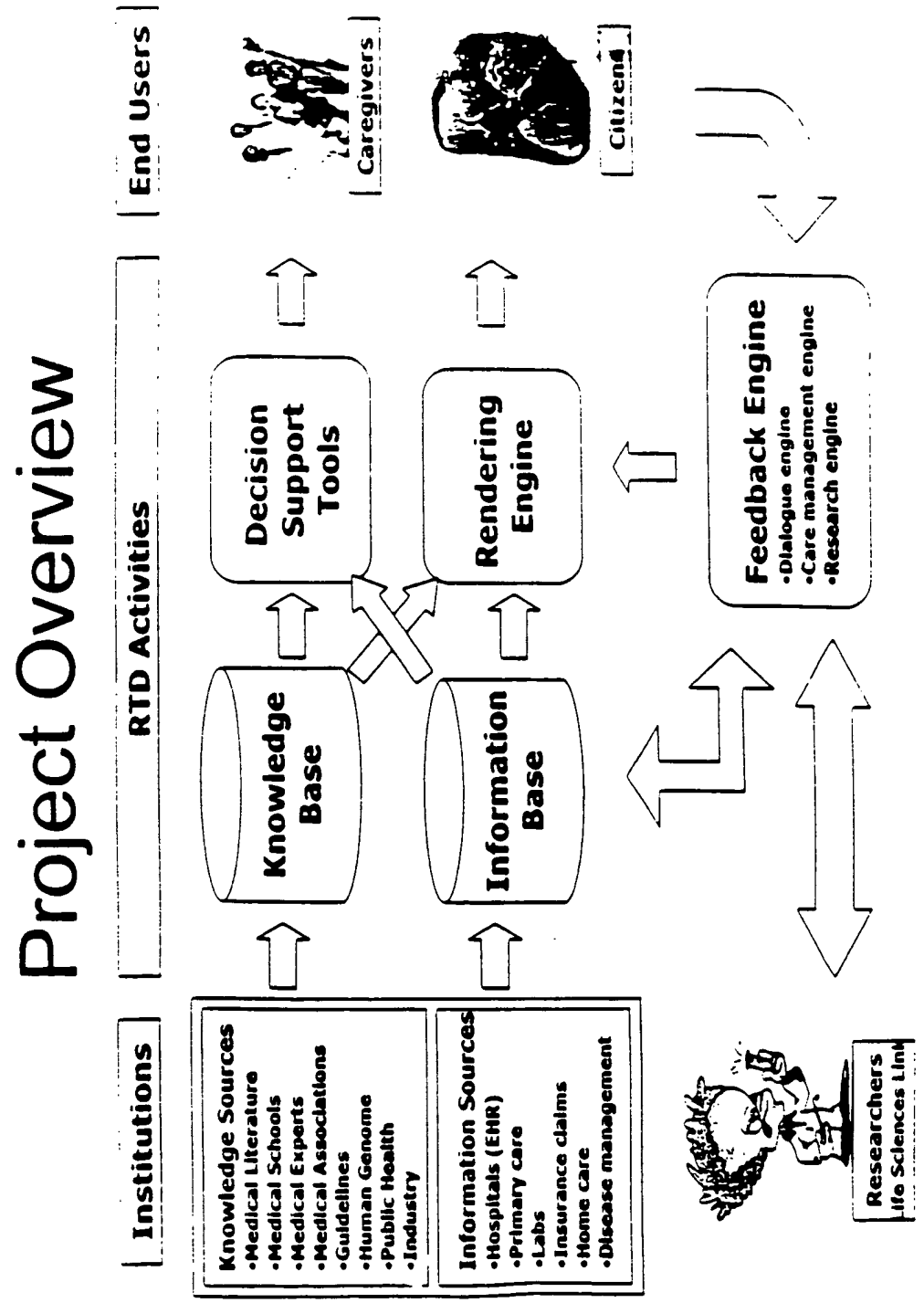
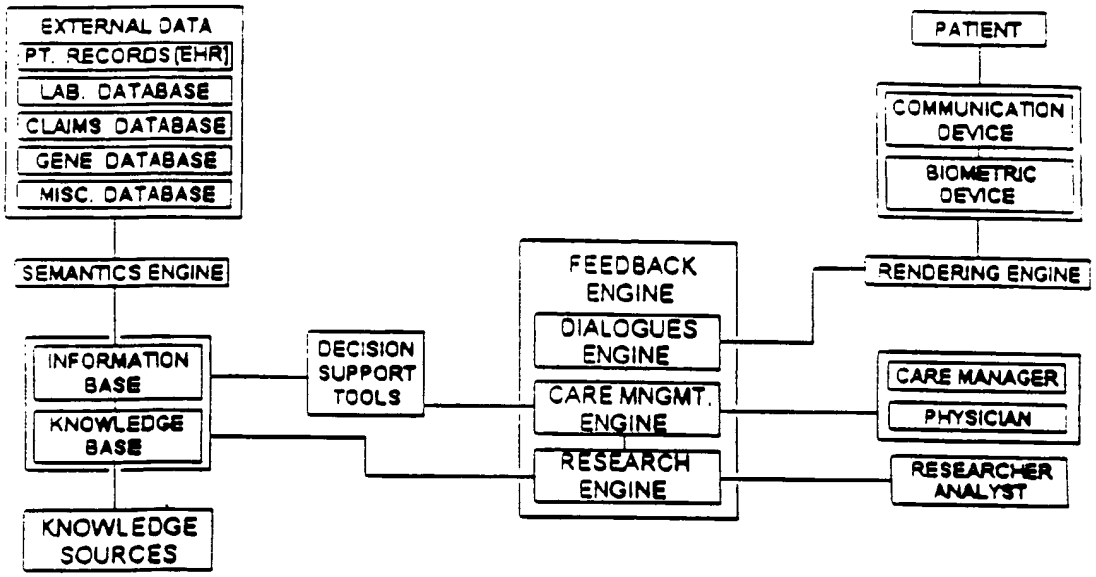


FIG. 1



SYSTEM ARCHITECTURE

System Architecture, from the viewpoint of Feedback Engine

FIG. 2

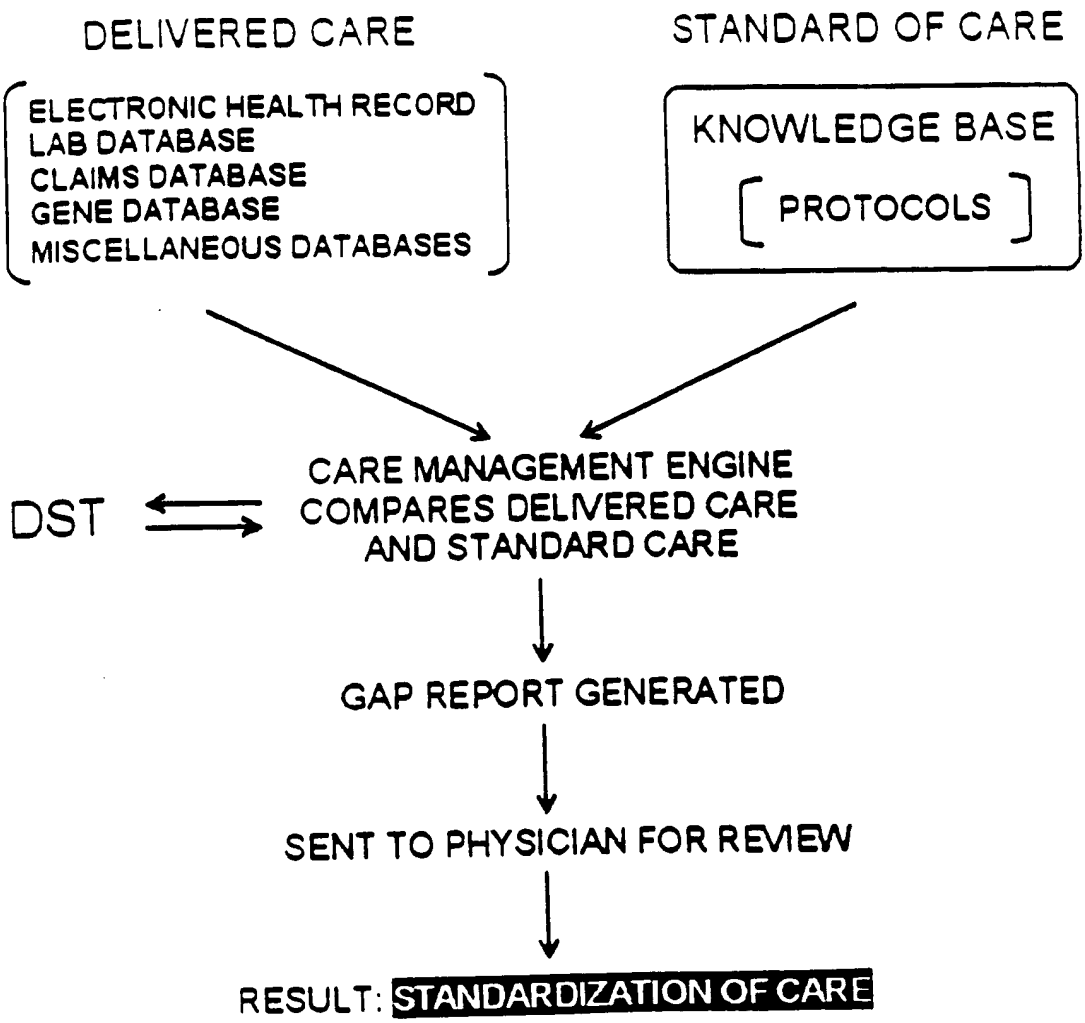

DELIVERED CARE
ELECTRONIC HEALTH RECORD
LAB DATABASE
CLAIMS DATABASE
GENE DATABASE
MISCELLANEOUS DATABASES
STANDARD OF CARE
KNOWLEDGE BASE
PROTOCOLS
DST
CARE MANAGEMENT ENGINE COMPARES DELIVERED CARE AND STANDARD CARE
GAP REPORT GENERATED
SENT TO PHYSICIAN FOR REVIEW
RESULT: STANDARDIZATION OF CARE

FIG. 3

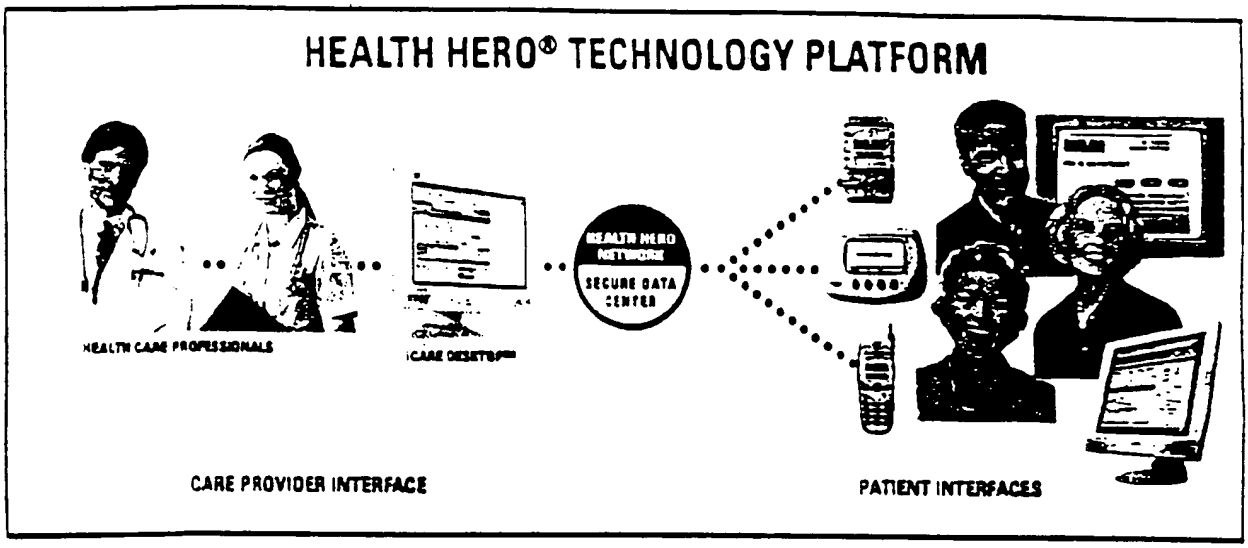

HEALTH HERO® TECHNOLOGY PLATFORM
SECURE DATA CENTER
CARE PROVIDER INTERFACE
PATIENT INTERFACES

FIG. 4

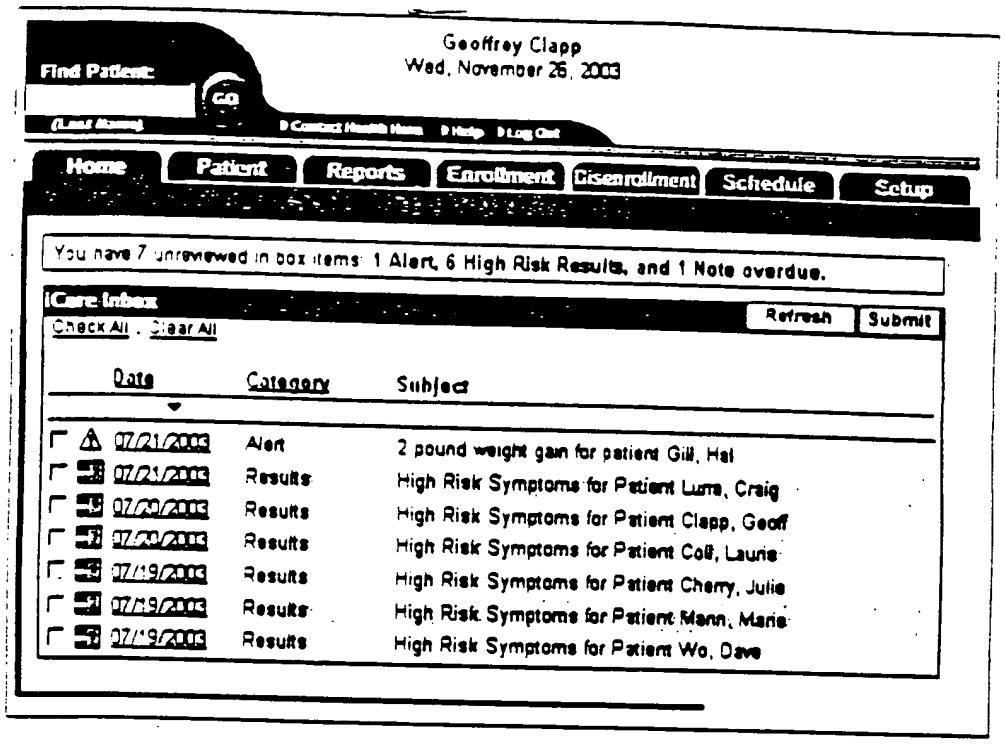

Find Patient:
Geoffrey Clapp
Wed, November 26, 2003
Home
Patient
Reports
Enrollment
Disenrollment
Schedule
Setup
You have 7 unreviewed in box items: 1 Alert, 6 High Risk Results, and 1 Note overdue.
Refresh
Submit
Check All
Clear All
Date
Category
Subject
07/21/2003 Alert 2 pound weight gain for patient Gill, Hal
07/21/2003 Results High Risk Symptoms for Patient Luna, Craig
07/20/2003 Results High Risk Symptoms for Patient Clapp, Geoff
07/20/2003 Results High Risk Symptoms for Patient Coll, Laurie
07/19/2003 Results High Risk Symptoms for Patient Cherry, Julie
07/19/2003 Results High Risk Symptoms for Patient Mann, Marie
07/19/2003 Results High Risk Symptoms for Patient Wo, Dave

FIG. 5

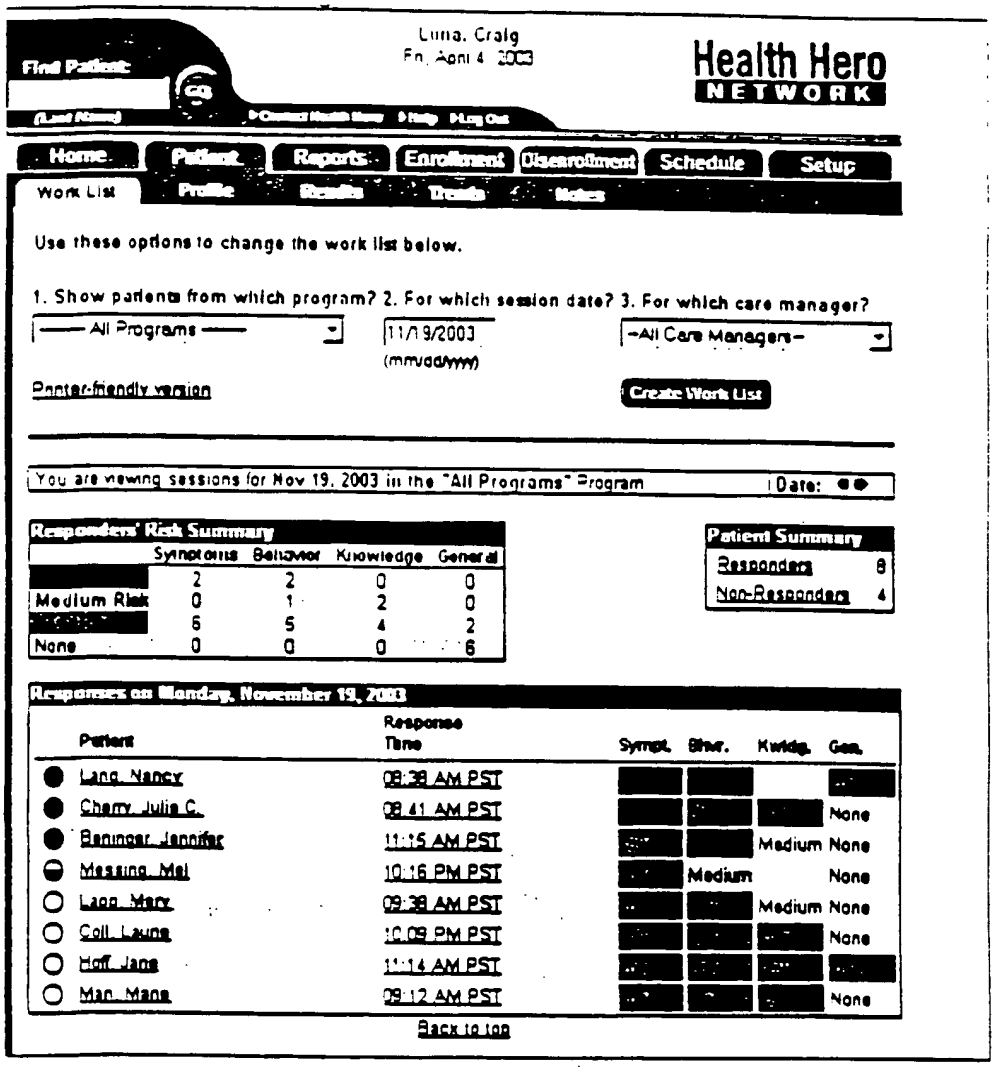

Find Patient:
Luna, Craig
Fri, April 4 2003
Health Hero NETWORK
Home
Patient
Reports
Enrollment
Disenrollment
Schedule
Setup
Work List
Profile
Use these options to change the work list below.
1. Show patients from which program?
2. For which session date?
3. For which care manager?
—— All Programs ——
11/19/2003
(mm/dd/yyyy)
-All Care Managers-
Printer-friendly version
Create Work List
You are viewing sessions for Nov 19, 2003 in the "All Programs" Program
Date:
Responders' Risk Summary
Symptoms
Behavior
Knowledge
General
Medium Risk
None
Patient Summary
Responders 8
Non-Responders 4
Responses on Monday, November 19, 2003
Patient
Response Time
Sympt.
Behav.
Kwldg.
Gen.
Lang, Nancy 08:38 AM PST
Cherry, Julie C. 08:41 AM PST
Beninger, Jennifer 11:15 AM PST
Messina, Mel 10:16 PM PST
Lang, Mary 09:38 AM PST
Coll, Laura 10:09 PM PST
Hoff, Jane 11:14 AM PST
Man, Mana 09:12 AM PST
Medium
None
Back to top

FIG. 6

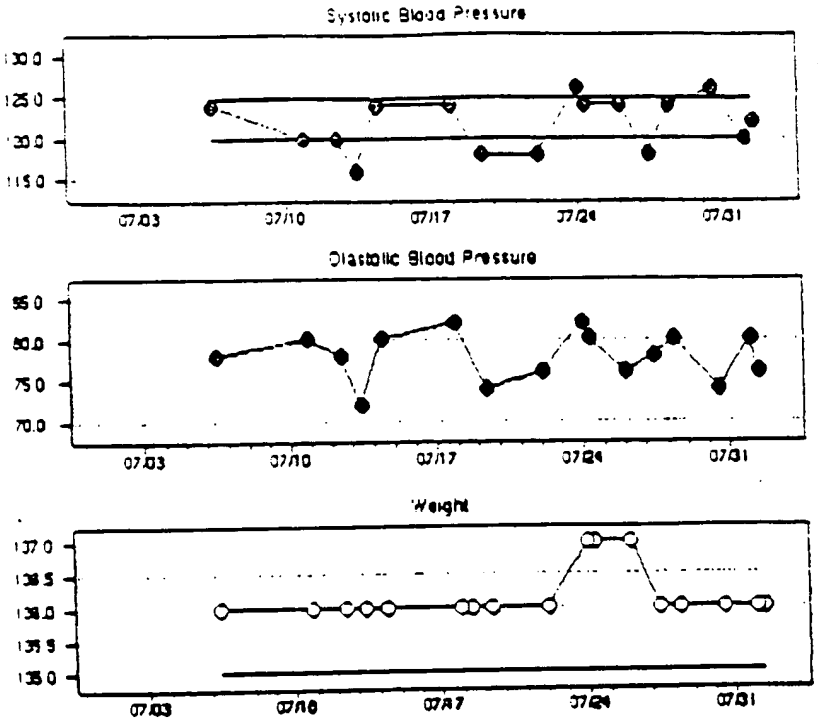
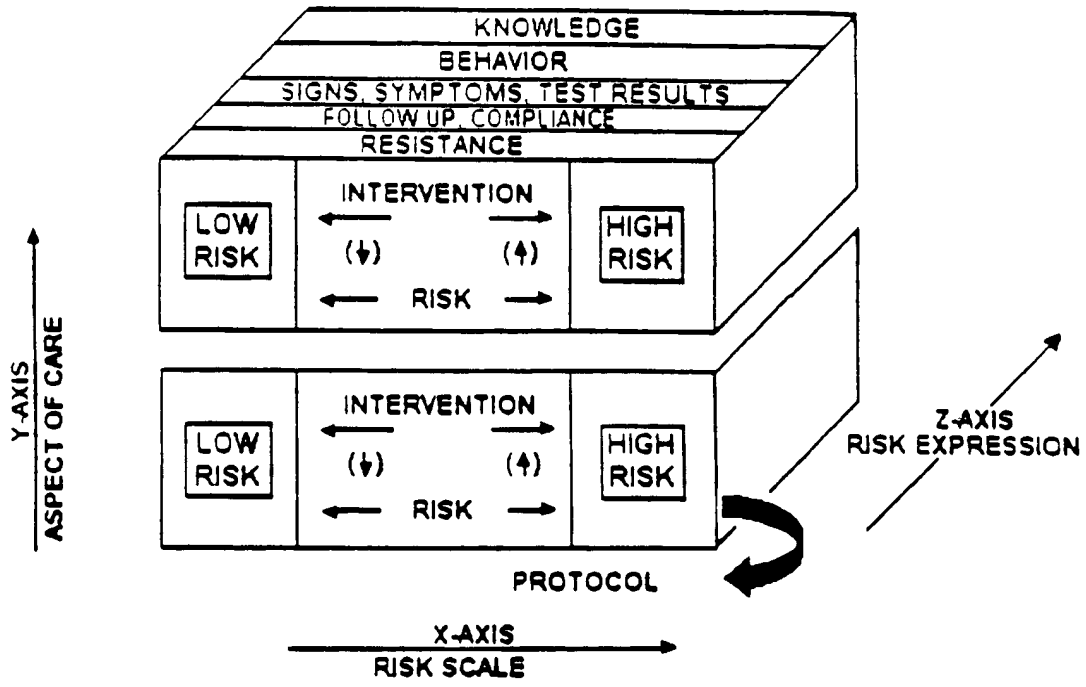

Systolic Blood Pressure
130.0
125.0
120.0
115.0
07/03
07/10
07/17
07/24
07/31
Diastolic Blood Pressure
85.0
80.0
75.0
70.0
07/03
07/10
07/17
07/24
07/31
Weight
137.0
136.5
136.0
135.5
135.0
07/03
07/10
07/17
07/24
07/31

FIG. 7

FIG. 8



A 3-dimensional model of disease.

FIG. 9

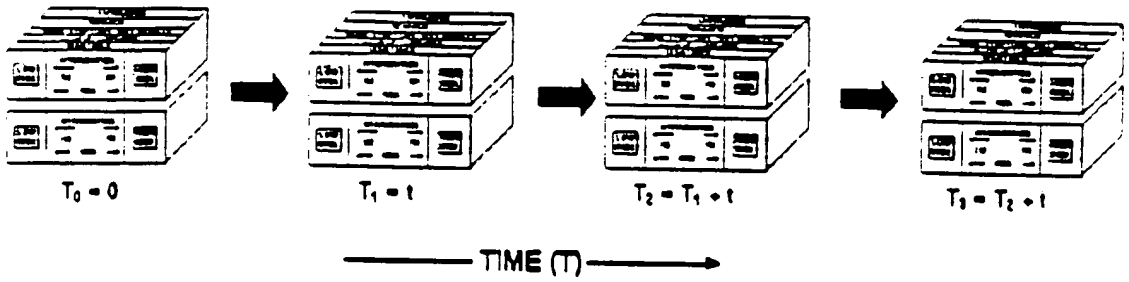
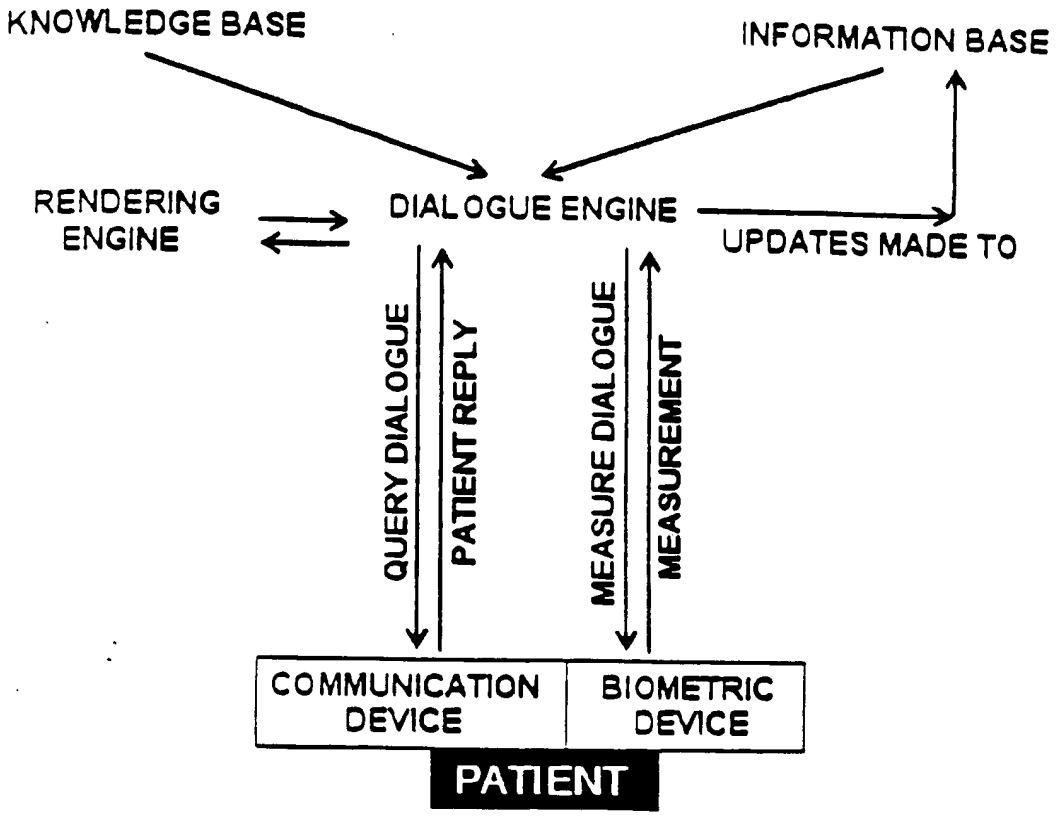
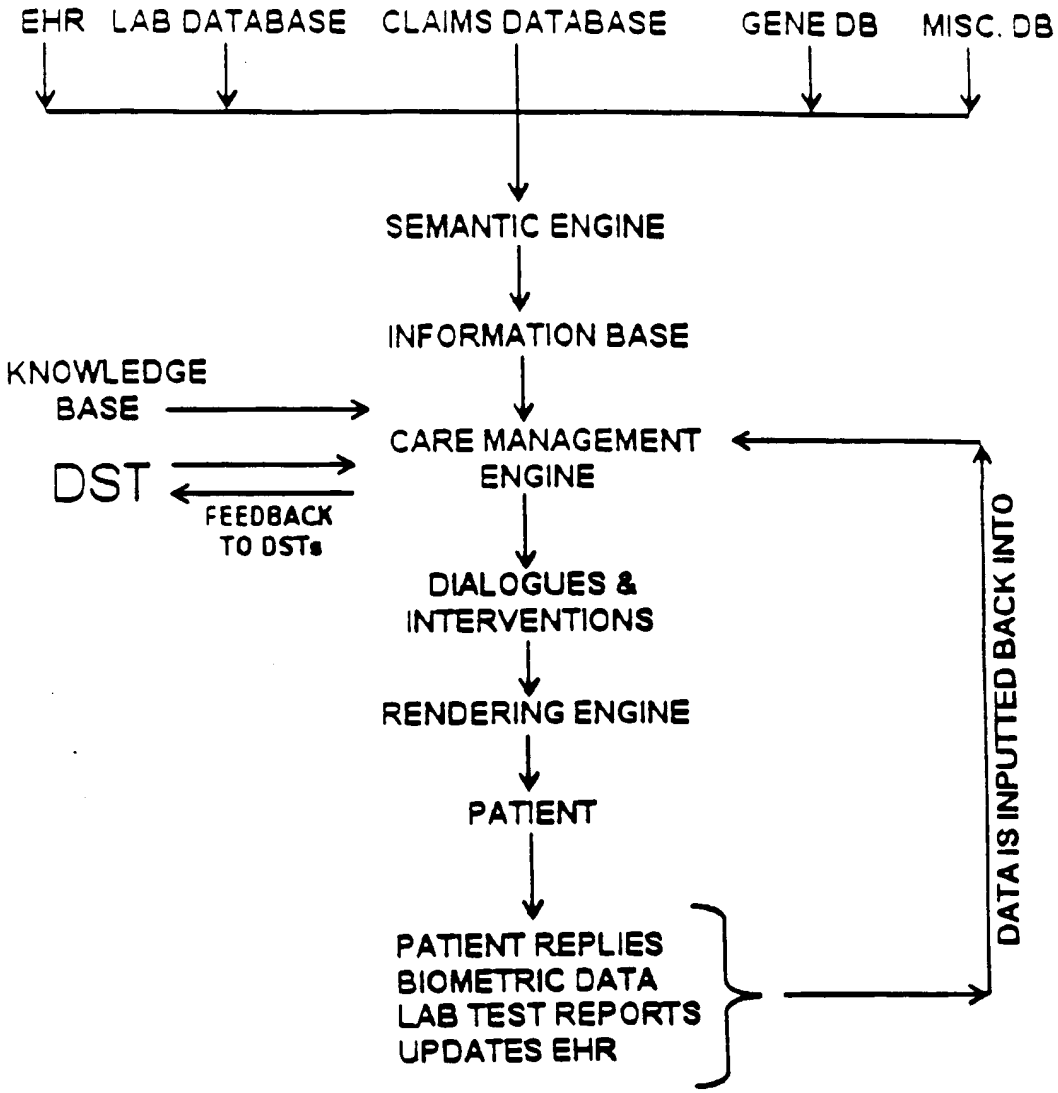


FIG. 10



INFORMATION FEEDBACK LOOP

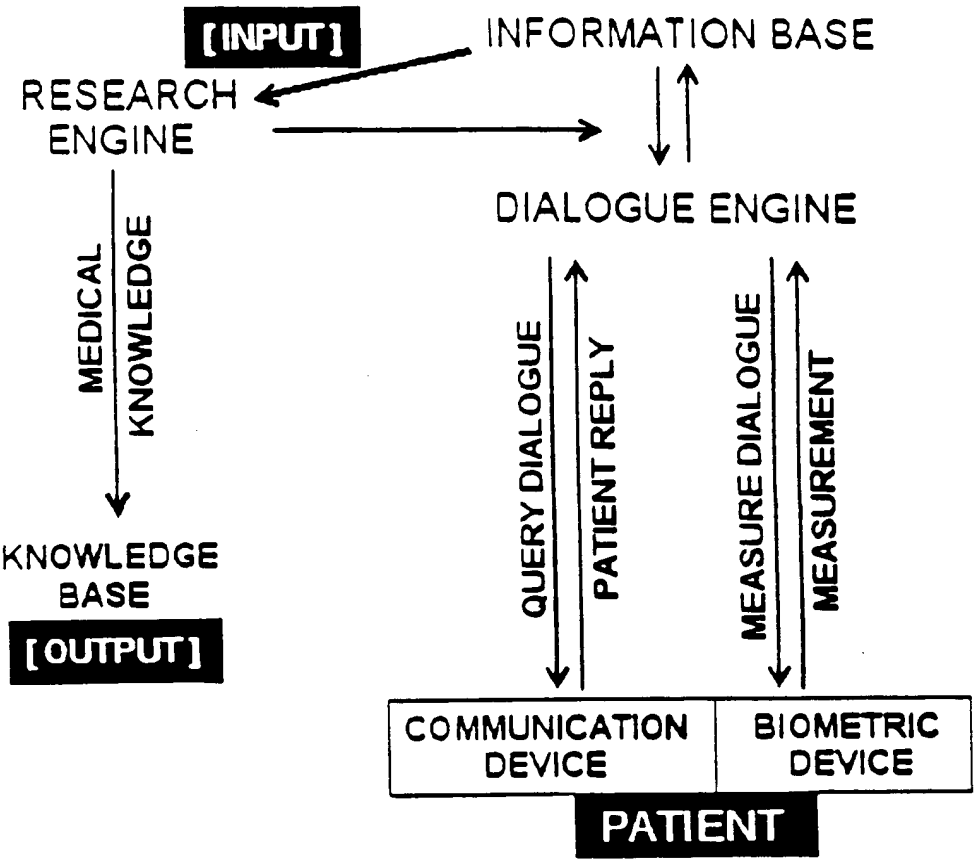
FIG. 11



DST FEEDBACK LOOP

FIG. 12

Research Feedback Loop-



RESEARCH FEEDBACK LOOP

FIG. 13

Agenda

- Health Hero Network Background
- Current Technology Solutions
- Contribution to MedKnowledgeMent
  - Information and Knowledge Acquisition → The Feedback Loops
  - Contribution to Innovations
  - Linkage to Other Parts of Project
  - Patient Trials and Expected Outcomes

FIG. 14

Health Hero Network Vision

- A better model of care is possible
- Crisis care → Coordinated care
- eHealth Networks and Technologies = A Powerful Enabler

FIG. 15

Health Hero Network

- Founded 1988 in Mountain View, California. Health Hero Network Ltd established 2003 in Dublin, Ireland.
- 25 employees, $5 million annual sales, serving 30 provider sites and 2500 patients with daily in-home monitoring.
- Solution Partners signed in Ireland, France, Netherlands. Expecting to add Spain, Belgium, Norway in 2003.
- Licensees include Veterans Health Affairs, Mercy Health System, American Medical Alert, TheraSense, Philips.

FIG. 16

eHealth Demonstration:

Veterans Health Affairs (US)

- Chronic care program using model of care based on eHealth Networks and Technologies from Health Hero Network
- 791 elderly high-risk patients with hypertension, heart failure, COPD, diabetes, enrolled for 1 year, compared to comparison group data
- Results (Disease Management, Volume 5, Number 2, 2002)
  - 63% reduction in hospital admissions
  - 60% reduction in hospital bed days
  - 40% reduction in emergency room visits
  - 64% reduction in nursing home admissions
  - 88% reduction in nursing home bed days
  - Significant improvement in Quality of Life

FIG. 17

eHealth Demonstration:

Mercy Health System (US)

- Diabetes management program using eHealth Networks and Technologies from Health Hero Network
- 169 low income diabetes patients, one year study period using comparative cohort data from previous calendar year
- Results (Diabetes Technology & Therapeutics Journal, Dec 2002)
  - Outpatient visits reduced 49% ($p < 0.001$)
  - Inpatient admissions reduced 32% ($p < 0.07$)
  - ER encounters reduced 34% ($p < 0.06$)
  - Significant increase in quality of life scores
  - Medication compliance increased from 34% to 94%

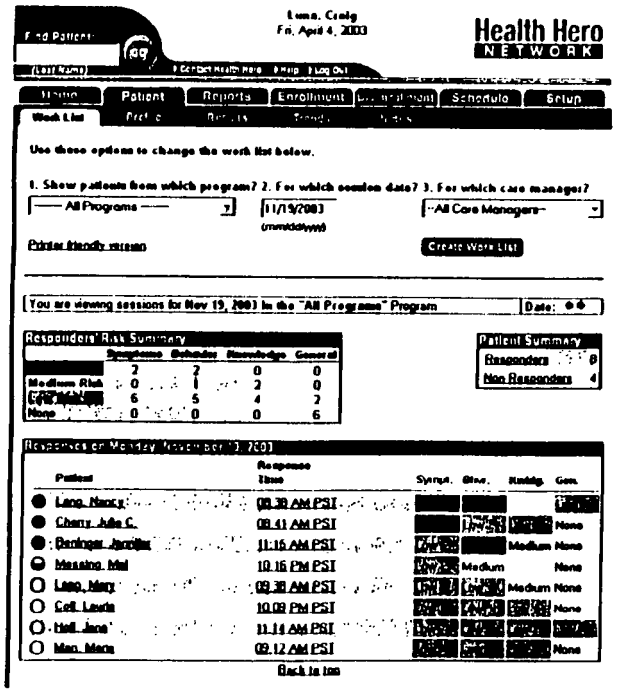
FIG. 18

Health Hero Network Platform
Vision: Open System for Chronic Care Research and Innovation, Any Device, Any Disease, Many Partners
Patients
Optional Home Medical Devices
Patient Interfaces
Dialogues
Data
Secure Data Center
Firewalls
Clinical Information Systems
Web Servers
Report Servers
Data Base Servers
Analysis Tools
Medical Community

FIG. 19

Decision Support Tools for Caregivers

Vision: Intelligent, Simple, Web-based, Integrated with Existing Clinical Information Systems and Care Processes



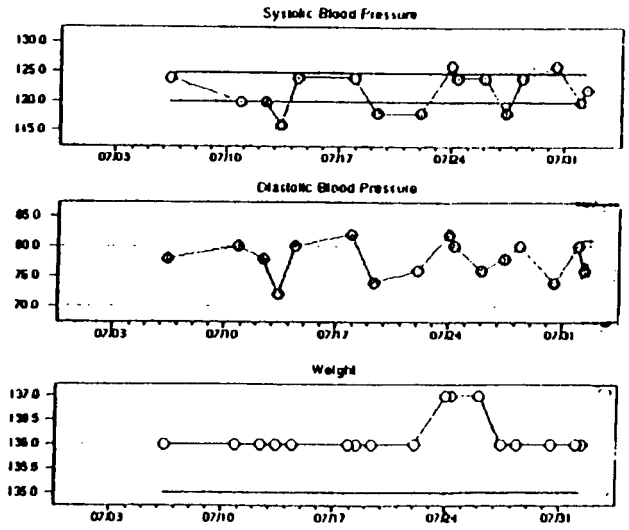


FIG. 20

Blakely, Sokoloff, Taylor & Zafman LLP (408) 947-8200
Title: Method and System For Integrating Feedback Loops in Medical Knowledge Development and Healthcare Management
1st Named Inventor: Stephen J. Brown
Application No.: 10/821,120 Docket No.: 6858P056
Sheet: 20 of 31

Daily Dialogue with the Patient

Vision: Intelligent, Interactive, Personalized, Simple, Integrated with Consumer and Medical Devices

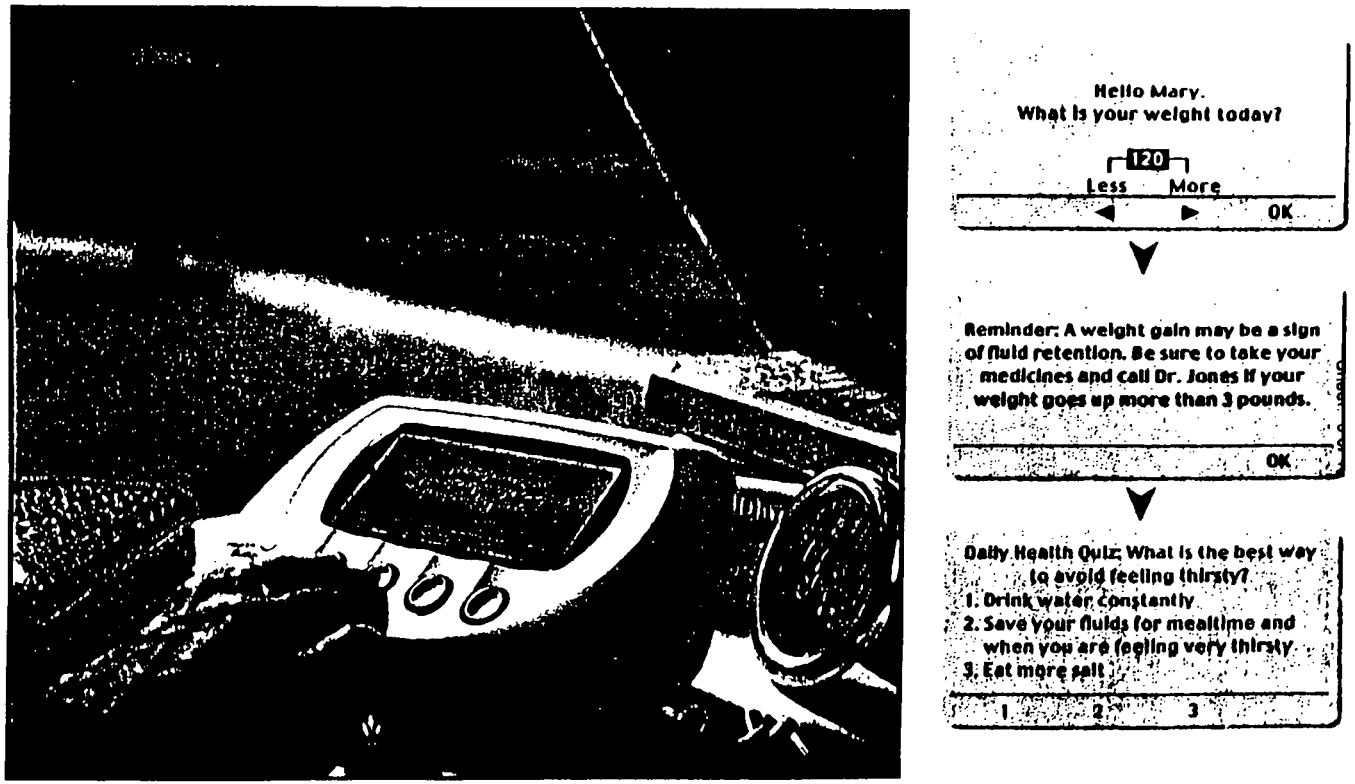


FIG. 21

Patient Dialogue Content

Vision: Based on Latest Medical Knowledge, Individualized, Generating Real-time Information

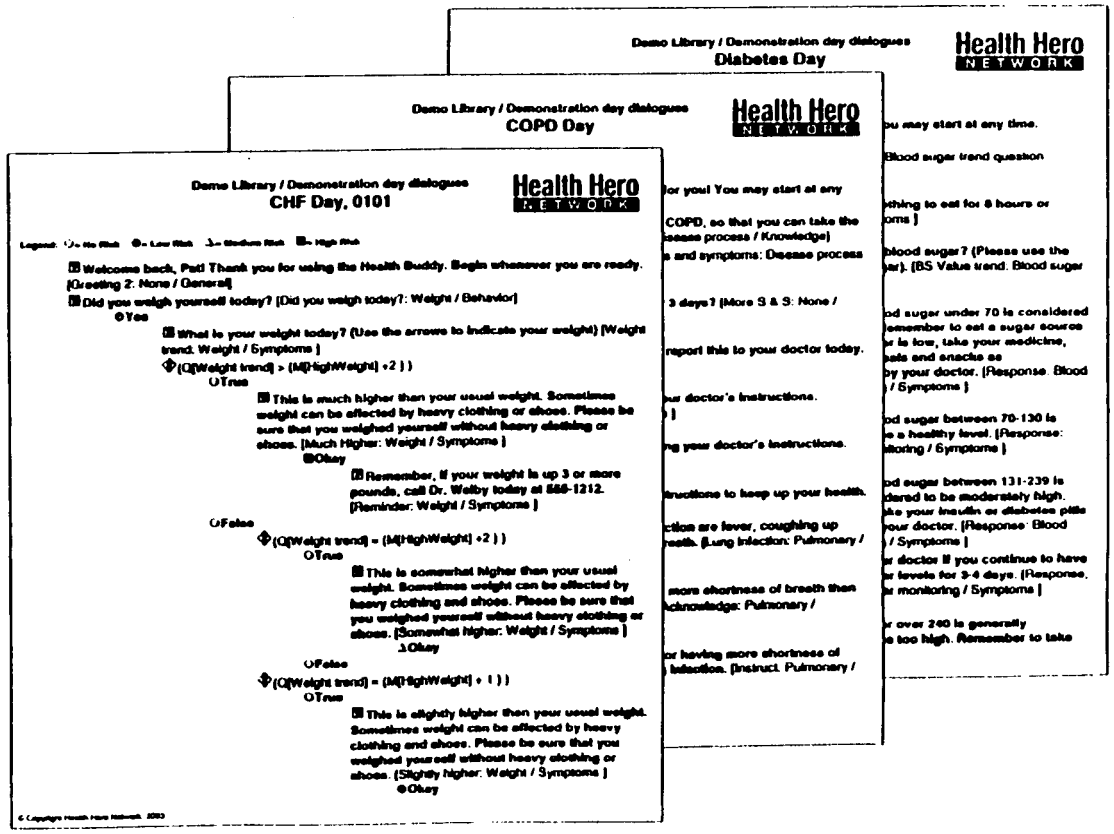


FIG. 22

Blakely, Sokoloff, Taylor & Zafman LLP
(408) 947-8200

Title: Method and System For Integrating Feedback Loops in Medical Knowledge Development and Healthcare Management
1st Named Inventor: Stephen J. Brown
Application No.: 10/821,120
Docket No.: 6858P056
Sheet: 22 of 31

Health Hero Network Contribution to MedKnowledgeMent

- 1.1 Information and Knowledge Sources and Formats
- 1.2 Information Acquisition → Information Base
- 1.3 Knowledge Acquisition → Knowledge Base
- 1.4 Information and Knowledge Processing → DSTs to identify gaps between Information Base and Knowledge Base (i.e. gaps between what is and what should be)
- 1.5 Information and Knowledge Rendering → Rendering Engine is the interface to end users
- 1.6 Information and Knowledge Acquisition → The Feedback Loops

FIG. 23

Project Overview

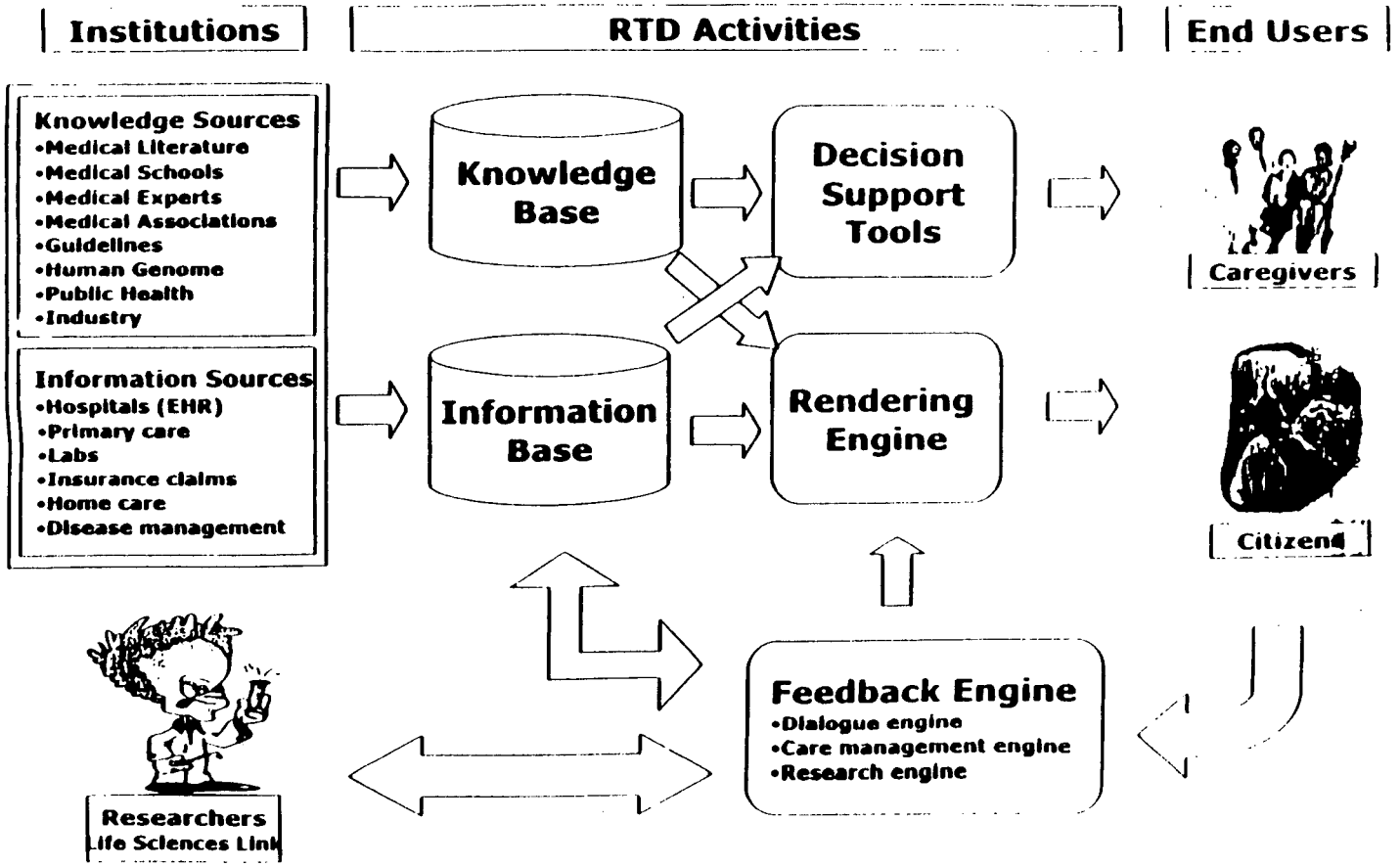


FIG. 24

Information and Knowledge Acquisition → The Feedback Loops

- Patient Dialogue Engine: Individualized Communication
  - → Generated using Information and Knowledge Base
  - → Interface with Rendering Engine
  - → Feedback to Information Base
- Care Management Engine: Just-in-time Care
  - → Generated using Information and Knowledge Base
  - → Feedback to DSTs
- Research Engine: Real-time Research
  - → Interface to Information Base [extract existing data]
  - → Interface to Dialogue Engine [when new data is required]
  - → Feedback to Knowledge Base [new discoveries]

FIG. 25

Blakely, Sokoloff, Taylor & Zafman LLP (408) 947-8200
Title: Method and System For Integrating Feedback Loops in Medical Knowledge Development and Healthcare Management
1st Named Inventor: Stephen J. Brown
Application No.: 10/821,120 Docket No.: 6858P056
Sheet: 25 of 31

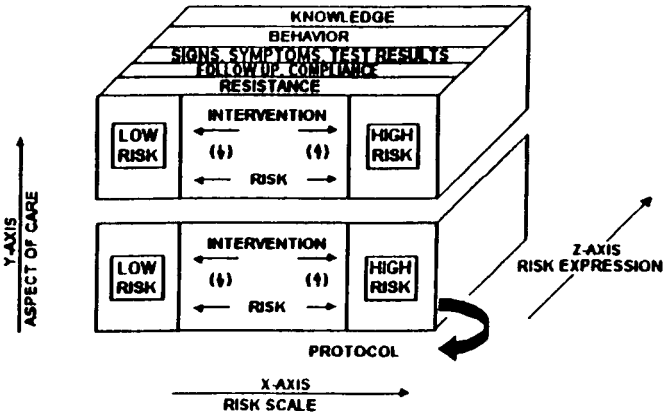
Health Hero Network
Contribution to Innovations

Current Status	New Innovations
Patient Dialogue Engine • Pre-packaged, mass customized programs • Content libraries • Health Buddy	⇒ • Automated individualization • Content generated by knowledge base rules applied to information base • Interface to Rendering Engine for any device
Care Management Engine • Risk stratification • Organizational workflow and efficiency tools • Manual feedback process	⇒ • Intelligent risk tuning and link to DSTs • Organizational optimization • Automated feedback loop
Research Engine • Data Export to SAS	⇒ • Identify subgroups and correlations • Test hypotheses on living database

FIG. 26

Integrating Feedback Loops Within MedKnowledgeMent

- Application Program Interfaces
- Standards for Data Classification
- Ontology for Information and Knowledge Used in Feedback Process



A 3-DIMENSIONAL MODEL OF DISEASE

FIG. 27

Feedback Process

Overall goal is apply and generate medical knowledge in a continuous process that leads to lowest achievable risk resulting in:

- → Higher quality of life
- → Improved clinical outcomes
- → Lower cost of care

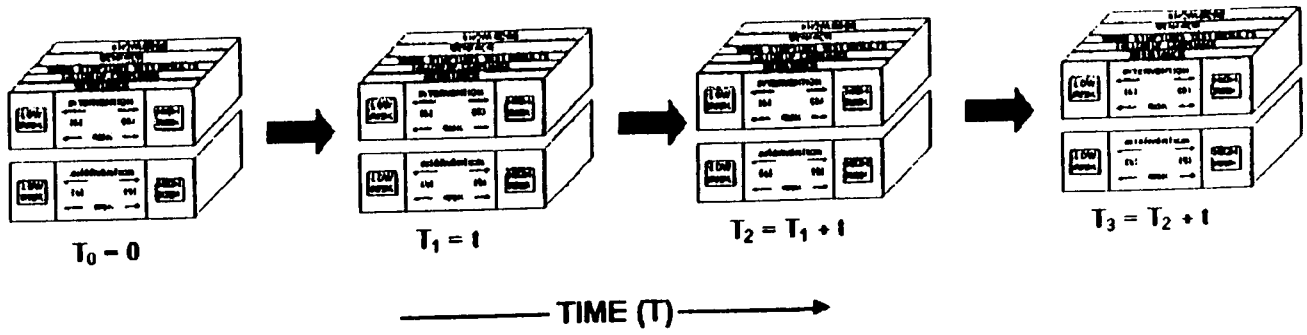


FIG. 28

Patient Trials

- Application to Major Diseases with Great Cost to Society
- Multi-center Demonstration Project
  - Health care and research centers in Europe
  - Large enough for meaningful result
  - Small enough to fit budget
- Standardized Protocol for Data Collection
- Outcomes Analysis
  - Aggregate data analysis for global impact
  - Site specific data analysis by country, disease, and care model
  - Key measures include: acceptability, satisfaction, utilization, clinical impact, medication compliance, quality of life, cost of care
- Medical Review Board
  - Review and approve all site specific study designs

FIG. 29

Blakely, Sokoloff, Taylor & Zafman LLP (408) 947-8200
Title: Method and System For Integrating Feedback Loops in Medical Knowledge Development and Healthcare Management
1st Named Inventor: Stephen J. Brown
Application No.: 10/821,120 Docket No.: 6858P056
Sheet: 29 of 31

Expected Results

- Reduced emergency department encounters and hospitalizations by detecting patient problems before they become a crisis.
- Improved patient compliance by educating, motivating and monitoring health status and by providing personalized and relevant information.
- Improved safety and quality of care by providing timely and actionable information to healthcare professionals through quality assured processes that can be continuously improved.
- Continuity of care, particularly for the elderly, through integrated, interconnected monitoring and information systems, rather than fragmented, episodic, and crisis driven care.

FIG. 30

Expected benefit to the EU

Health is a key IST application for all citizens

- Stimulation of investment in information society technologies to modernize healthcare and enable sustained quality and access.
- Creation of an open platform for the application and generation of Medical Knowledge is an opportunity for European leadership at the convergence of information technologies, medical and consumer devices, and networks.
- Clinical applications that can be deployed as new service offerings over existing and new network infrastructures including broadband and wireless networks will stimulate the growth and success of those networks.
- The emerging eHealth sector will become vital to every region in the world that will experience the demands of an aging population and the resulting need for advanced and sustainable models of care.

FIG. 31